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eastern or southern side would only be extended to a depth of 8·50 mètres (28 feet). Its length would be 2500 mètres (2734 yards). Their general direction will be from S.W. ¼ S. to N.E. ¼ N., and the extremity of one will be slightly deflected, so that the tangent of the two heads should lie exactly S.S.W. and N.N.E., and be exactly 1000 mètres in length (1093½ yards).

"Subsequent investigations have, however, induced the engineers to dispense in a great measure with the length of these jetties, the nature of the sand being sufficiently firm to admit of dredging operations being successfully performed.

"By this means a sheltered roadstead, or outer port, would be formed, embracing a superficies of 40 hectares (98 acres), perfectly sheltered from the N.W. winds which prevail along this coast, and bring with them the greatest part of the storms. Vessels will be enabled to enter in all weathers, which is the essential point; and there will, besides, be a sort of inner road formed by the roadstead between the jetties. The length of this roadstead will be 1800 mètres (1968½ yards), measuring from the extremity of the southern jetty, by 400 mètres (437½ yards). This would form an additional space of 72 hectares (177 acres 3 roods), in which vessels would find shelter and smooth water.

"With regard to what Captain Pim states as to the mud of the Nile, I have to say that is a question to which the attention of the engineers was directed with more than usual care. One fact is perfectly certain, no traces of mud are to be found along the shore, and the sand upon it is as pure as it is fine. This sand extends along the bottom, without any admixture, to a depth ranging from 8 to 9 mètres (26 to 29½ feet). The mud does not commence until beyond this range, and it is only at a depth of 10 mètres (32 feet 8 inches) that pure mud is found, and from thence it stretches out to an indefinite distance in the depths of the Mediterranean. Though here and there a few patches of mud may occur at a less depth, they are of insignificant dimensions, not exceeding 10 to 15 mètres (32 to 49 feet) in diameter, and 0·25 to 0·40 mètres (10 to 15 inches) in thickness. Such deposits are recent and superficial, and have not been subjected to the effects of a storm; they are of purely accidental occurrence, and the first gale of wind from the north would entirely disperse them."

Eleventh Meeting, May 9th, 1859.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Capt. C. C. Chesney,* R.E.; *Capt. K. R. Murchison; Consul W. T. Pritchard; and E. Rawdon Power, Esq.; were presented upon their election.*

ELECTIONS.—*L. C. Bailey,* R.N.; *R. Fisher,* M.D.; *and John Reeve, Esqrs.; were elected Fellows.*

EXHIBITIONS.—Several Maps and Plans of fortified towns, &c., in Italy, presented by the Government of Rome; and Maps of United States Harbour Improvements on Lake Michigan; were exhibited.

The Papers read were:—

1. *Notes on the Lower Danube.* By MAJOR STOKES, R.E.

Communicated by CAPT. R. COLLINSON, R.N., F.R.G.S.

THE "lower" portion of the Danube begins at the Iron Gates, and has an entirely different character to that of its upper course. It spreads into many channels whose banks and beds change yearly and even monthly,—a cause that renders charts of little value to its navigators. The vessels used in the river seldom draw more than 4 feet, and even that is too much for the Iron Gates in autumn. Sea-going vessels rarely, if ever, pass Oltenitza.

The final subdivisions of the Danube are as follows: 1st, the Kilia branch, which contains $\frac{17}{27}$ths of the whole river. It forms a delta of its own, and enters the sea in five principal channels; 2nd, the St. George's branch, which contains $\frac{8}{27}$ths; and, thirdly, the Sulina branch, which contains the remaining $\frac{2}{27}$ths. The Sulina is the only navigable outlet; but the St. George would be a far better one if the bar that obstructs its mouth were removed or turned by a canal. For the St. George is broad and deep up to its very mouth, while the Sulina is narrow and obstructed by shoals.

The land between Galatz and the head of the delta is marshy and reed-grown, and decidedly lower than the banks of the river, except at those points where spurs of the Dobrudscha mountains or portions of the steppe extend to them. Inundations occur every five or six years. The Delta itself is rarely, if ever, flooded; it is covered with a dense mass of reeds, and on its higher parts with forests of ash and stunted oak. There are data by which the rate of increase of the Delta may be measured, for a map is in existence, of the date 1769, in which the Kilia branch is made to enter the sea at the point where we now find the Wilkowi Basin—that is to say, at *five miles* from its present mouths. Again, there is another Russian plan, without date, but giving the city of Odessa, which was founded in 1796, and which represents the mouth of the Kilia at the same place, but indicates the commencement of a formation of islands in front of it, which seem to be the ground-work of the present Kilia delta. There was an actual survey made in 1829-30 by the Russian Government, and another by H.M.S. *Medina*, under Captain Spratt, in 1857. The delta had increased 4000 feet in that interval of time, and the line of 4-feet sounding had advanced in a still greater proportion. Many statistical details are appended to the paper, and arguments in favour of the various plans proposed for improving the navigability of the river are discussed.

Mr. Hamilton, f.r.g.s., said: In rising to address a few words to you, Sir, upon this subject, I do so with the view of recommending those who have heard the paper read not to place too much confidence in that brown dotted line which has been stretched across that map as the limit of the sea-shore in the year 1769; because it is absolutely impossible, when we look at the amount of matter brought down by other rivers, and which has tended to the formation of the deltas of other rivers, that we can look upon this movement—this new matter which has been added to the coast during the period in question (since 1769)—as in any way giving us a rule respecting the question of increase in the deltas of rivers under ordinary circumstances. Looking at it in that point of view, therefore, the impression which has been left on my own mind is this:—that, either the maps that give us the coast-line in the year 1769, as exhibited by that dotted line, are exceedingly faulty, or that, if that really were the line of coast at that period, it must have been owing to some abnormal state of things; and that, owing to a change of currents, or to earthquakes, or to other causes, into which we are not at present capable of entering, the line of coast was not then in its normal state; and that subsequently it has returned to that which may be considered its normal state. This may be the result of two causes: first, the matter brought down by the Danube; secondly, the prevailing winds of the Black Sea, which during the summer are from the eastward, and would, therefore, tend to collect a great amount of matter along that coast during a given period. I think that the increment given during this period of 80 or 90 years is somewhere about 18 or 20 miles. If we look at the increase of the deltas of other great rivers—such, for instance, as the Ganges, the Mississippi, and rivers of that class—we find that the increase here stated is altogether out of proportion to anything we are acquainted with in those rivers; so much so, indeed, that I can only look upon it as altogether erroneous. I dare say that those gentlemen who are acquainted with the old writers will recollect the oracular verses quoted by Strabo with respect to the Pyramus, one of the rivers in Asia Minor, which brought down such an enormous quantity of sand and mud that its delta was expected to increase to an enormous extent:—

Ἔσσεται ἐονομένοις ὅτε Πύραμος ἐυρυαδίνης
Ἡϊόνα προχέων ἱερὴν ἐις Κύπρον ἵκηται.

The meaning of which was, that a time should come in future generations when the delta of the Pyramus should be increased to so large an extent by the mud brought down from the interior, that it should stretch along the sacred land of Cyprus. Now we know that the delta of the Pyramus has not increased one mile since that was written. Therefore, I must warn those who have heard this paper read against looking upon this increment as anything like the normal state of increment which is to be expected as resulting from the matter brought down by any of the great rivers of the globe during the period that has been referred to.

The Second Paper read was:—

2. *Observations on the Geography of Central Africa.* By JAMES MACQUEEN, Esq., F.R.G.S.

MR. MACQUEEN cites in his paper the authorities that exist on the subject of the Upper White Nile, and on Kilimandjaro, with a view of proving that the latter mountain is undoubtedly snow-covered; and that, on the other hand, it has no connection with the river. He repeats the well-known description of Rebmann, who, during a period of two months that he spent in its neighbourhood, saw Kilimandjaro every day that it was clear, and even passed some time within five or six miles of the snow-covered part; and who, in further corroboration of the existence of snow, mentions how the